Name _____ Calculus Q1 T1

Review of limits and continuity

1. Determine the value of *c* that makes the piecewise-defined function *g(x)* everywhere continuous. $g(x)=\begin{cases}\sqrt{x+4}, & x<5\\ x^2+c, & x\geq 5\end{cases}$

2. Is *h(x)* continuous for all real numbers? If so show why.

$$h(x)=\begin{cases}x+3, & x\leq -1\\ -x^2, & x>-1\end{cases}$$

3. Evaluate $\lim_{h\to 0}\frac{(2+h)^2-4}{h}$.

4. Evaluate $\lim_{x\to 4}\frac{x-4}{\sqrt{x^2-16}}$.

5. Evaluate $\lim_{x\to 0}\frac{2^x-1}{2^x}$.

6. Evaluate $\lim_{x\to 2}\frac{x^2+3x-10}{x-2}$.

7. Evaluate $\lim_{x\to\infty}\frac{2x^3-3}{3x^3+25}$.

8. Evaluate $\lim_{x\to\infty}\frac{2x^7+3x}{3x^5+2x}$.

9. Evaluate $\lim_{x\to 1}\frac{x-1}{\sqrt{x^2+3}-2}$.

10. Evaluate $\lim_{x\to 4}\frac{x+14}{\sqrt{x^2-7}}$.

In # 11 – 20, which of the statements are true about the function y = f(x) graphed and which are false?

11. Find $\lim_{x \to -1^+} f(x) = 1$.

12. Find $\lim_{x \to 2} f(x) = DNE$.

13. Find $\lim_{x \to 2} f(x) = 2$.

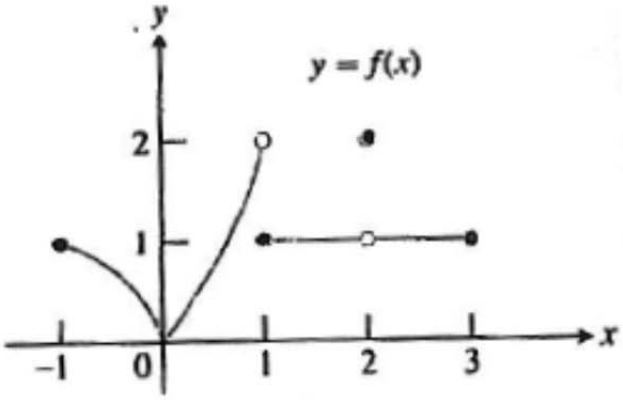
14. f(2) = 2

15. Find $\lim_{x \to 1^-} f(x) = 2$.

16. Find $\lim_{x \to 1^+} f(x) = 1$.

17. Find $\lim_{x \to 1} f(x) = DNE$.

18. Find $\lim_{x \to 0^+} f(x) = \lim_{x \to 0^-} f(x)$.



19. $\lim_{x \to c} f(x)$ exists at every c in (-1,1)

[note: () means that the endpoints are not included].

20. $\lim_{x \to c} f(x)$ exists at every c in (1,3).

[note: () means that the endpoints are not included].